What is claimed is;

1. An etching method for plasma-etching an SiO_2 film layer covering an SiN_x film layer formed at a workpiece placed inside an air-tight processing chamber by raising to plasma a processing gas induced into said processing chamber, wherein;

said processing gas is a mixed gas containing at least C_4F_8 and CH_2F_2.

2. An etching method for plasma-etching an SiO_2 film layer covering an SiN_x film layer formed at a workpiece placed inside an air-tight processing chamber by raising to plasma a processing gas induced into said processing chamber, comprising;

a first step in which said SiO_2 film layer is etched by using a mixed gas containing at least C_4F_8 and CO as said processing gas; and

a second step in which a switch is made to a mixed gas containing at least C_4F_8 and CH_2F_2 to be used as said processing gas to etch said SiO_2 film layer immediately before said SiN_x film layer becomes exposed.

3. An etching method for plasma-etching an SiO_2 film layer covering an SiN_x film layer formed at a workpiece placed inside an air-tight processing chamber by raising to plasma a processing gas induced into said processing chamber, comprising;

a first step in which said SiO_2 film layer is etched by using a mixed gas containing at least C_4F_8 and CO as said processing gas; and

a second step in which a switch is made to a mixed gas containing at least C_4F_8 and CH_2F_2 to be used as said processing gas to etch said SiO_2 film layer immediately after said SiN_x film layer becomes exposed.

4. An etching method according to any of claims 1, 2 and 3, wherein;

the flow rate ratio (CH_2F_2 / C_4F_8) of C_4F_8 and CH_2F_2 in said mixed gas containing at least C_4F_8 and CH_2F_2 is set essentially within a range of 0.4 ~ 1.0.

5. An etching method according to any of claims 1, 2 and 3, wherein;

the partial pressure corresponding to C_4F_8 relative to the entire pressure of said mixed gas copntaining at least C_4F_8 and CH_2F_2 is set essentially within a range of 0.4 (mTorr) ~ 0.8 (mTorr).

6. An etching method according to any of claims 1, 2 and 3, wherein;

the density of plasma excited inside said processing chamber is set essentially within a range of 1.5 X 10^{10} (number of ions / cm^3) ~ 1.2 X 10^{11} (number of ions / cm^3).

7. An etching method according to any of claims 1, 2 and 3, wherein;

said workpiece is placed on a mounting surface of a susceptor provided inside said processing chamber; and

the temperature of said susceptor is set essentially within a range of 20 °C ~ the heat resistance temperature of a photoresist layer constituting a mask pattern for said SiO_2 film layer.

8. An etching method according to any of claims 1, 2 and 3, wherein;

said mixed gas containing at least C_4F_8 and CH_2F_2 further contains an inert gas.

9. An etching method according to claim 2 or 3, wherein;

said mixed gas containing at least C_4F_8 and CO further contains an inert gas.